

Temporal Evolution of the Nanostructures in Model Nickel-based Superalloys

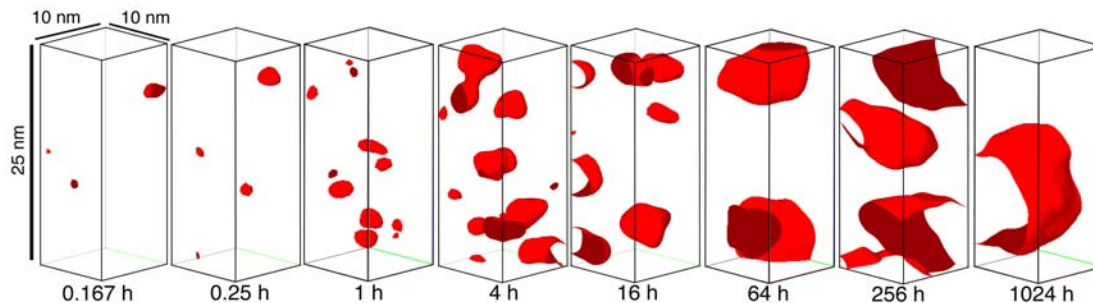
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◆ The **nucleation, growth and coarsening** of a new phase are ubiquitous in nature, occurring in the majority of phase separation processes

◆ With **subnanoscale resolution**, we investigate experimentally the temporal evolution of nanometer sized precipitates in model Ni-based superalloys.

◆ These **three-dimensional atom-probe microscope images** show as a function of time the genesis and evolution of the precipitates in Ni -5.2 Al-14.2 Cr at. % when aged at 600°C



Growth of Ni_3Al precipitates evolving with time

◆ Three fundamental quantities, **number density (N_v)**, **average size ($\langle r \rangle$)**, and **chemical supersaturation (Δc)** fully characterize the phase transformation, where established theories predict **temporal power law dependencies of -1, 1/3 and -1/3, respectively**

